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EXAMINER

CASCA, FRED A

ART UNIT PAPER NUMBER

2687

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/788,645

Applicant(s)

ROBERT FRIDAY

Examiner

Fred A. Casca

Art Unit

2687

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-25, 27-33, 35-37 and 39-43 is/are rejected.
- 7) ☒ Claim(s) 7, 26, 34, and 38 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-6, 8-9, 20-21, 23, 25, 27, 28, 33, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zegelin (US Pub No. 2005/0185615 A1), in view of Lee (US Pub. No. 2002/0045424 A1).

Referring to claim 1, Zegelin discloses in a wireless network environment comprising a plurality of access elements and at least one wireless node, wherein the wireless node is operative to transmit wireless frames on a plurality of operating channels to discover access points with which to connect (Fig. 1, abstract, paragraphs 5, “association between a mobile unit and an access point is changed as mobile units move within an area having a plurality of access points”, note that each access element in a WLAN is assigned a specific channel to communicate with the wireless nodes so that there is no interference with the other access elements, hence the wireless nodes are operative to transmit frames on a plurality of channels),

a method for refreshing signal information in a wireless node location mechanism (paragraph 5, 7, 8, 16, and 17, “association between a mobile unit and an access point is changed as mobile units move within an area having a plurality of access points”, “determining direction of change of location of a mobile unit”, “signal strength”, “roaming functions”, note that the movement of the mobile units (wireless node) causes a changes in the relation between the

wireless node access points, hence signal information is refreshed as movement takes place and continues), comprising

receiving a request to estimate the location of a wireless node connected to a wireless network (paragraph 19, “initial decision on requesting association with an access point”);

collecting signal strength values, detected at a plurality of radio receivers, corresponding to signals transmitted by the wireless node; and computing the estimated location of the wireless node based at least in part on the signal strength values detected by the plurality of radio receivers (Figures 2-3, and paragraph 17-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”, note that the cell controller rates access points for association based on signal strength and other factors).

Zegelin does not specifically disclose terminating the connection between the wireless node and the wireless network.

-----In the same field of endeavor, Lee discloses terminating the connection between the wireless node and the wireless network (paragraph 35, 64, and 65, “communication can be made only after terminating the current communication and performing a registration procedure”, “path between the previous Bluetooth access point is disconnected and communication with the new Bluetooth access point is achieved”).

It would have been obvious to one of the ordinary skills in the art at the time of invention to incorporate the teachings of Lee into that of Zegelin, and consequently providing the method of Zegelin with terminating the connection between the wireless node and the wireless network,

as suggested by Lee, so that a better connection is achieved between the wireless node and the access point and consequently minimizing signal loss and disturbance.

Referring to claim 2, the combination of Zegelin/Lee disclose the method of claim 1, and further disclose the computing step comprises providing the collected signal strength values to a wireless node location model that returns an estimated location for the wireless node (Zegelin, paragraphs 16-20, “computer 12 is advantageously used to enhance the association and roaming functions”, “computer 12 . . . act as a cell controller”, “association . . . rated by a cell controller”).

Referring to claim 4, the combination of Zegelin/Lee discloses the method of claim 1, and further disclose the wireless network comprises at least one access point (Zegelin, Figure 1, “AP”).

Referring to claim 5, the combination of Zegelin/Lee disclose the method of claim 4, and further disclose at least one of the radio receivers is an access point in the wireless network (Zegelin, Figure 1, “AP”).

Referring to claim 6, the combination of Zegelin/Lee disclose the method of claim 1 wherein at least one of the access elements is an access point in the wireless network (Zegelin, Figure 1, “AP”).

Referring to claim 8, the combination of Zegelin/Lee disclose the method of claim 1, and further disclose the computing step comprises identifying the access elements associated with the signal strengths to be used in locating the wireless node, selecting aspects of an RF physical model associated with the identified access element, and computing the estimated location of the wireless node using the signal strengths of the signals detected by the identified radio receivers and the selected aspects of the physical model (Zegelin, Figures 1-3, paragraphs 16-22, and paragraphs 19-23, “proximity of the mobile unit”, “relative movement of the mobile unit with respect to access point”, “sequential location determinations” “initial decision on requesting association with an access point can be based on the signal strength of the beacon signals”, “first parameter is proximity of the mobile unit”, “relative movement”, “mobile unit can detect signal strength using the RSSI function”, “decision on association may be based on selection parameters”, note that each access point (access element) transmits a beacon signal and each beacon signal delivers a corresponding signal strength value that specifies a particular RF coverage area. And since the physical locations of the access elements are known, the RF coverage area corresponds to the physical locations of the access elements are able to cover).

Referring to claim 9, the combination of Zegelin/Lee disclose the method of claim 8 and further disclose the aspects of the RF physical model are coverage maps corresponding to respective radio receivers (Zegelin, paragraphs 19-23, “proximity of the mobile unit”, “relative movement of the mobile unit with respect to access point”, “sequential location determinations”).

Referring to claim 20, Zegelin discloses in a wireless network environment comprising a plurality of access elements and at least one wireless node, wherein the wireless node is

operative to transmit wireless frames on a plurality of operating channels to discover access points with which to connect, wherein the access elements are operative to transmit responses to the wireless node (Fig. 1, abstract, paragraphs 5 and 19, “association between a mobile unit and an access point is changed as mobile units move within an area having a plurality of access points”, note that if an access point (access element) does not want to grant association to a mobile unit association can be refused, hence, the access element are operative to transmit responses to wireless nodes. Further note that each access element in a WLAN is assigned a specific channel to communicate with the wireless nodes so that there is no interference with the other access elements, hence the wireless nodes are operative to transmit frames on a plurality of channels),

a method for refreshing signal information in a wireless node location mechanism (paragraph 5, 7, 8, 16, and 17, “association between a mobile unit and an access point is changed as mobile units move within an area having a plurality of access points”, “determining direction of change of location of a mobile unit”, “signal strength”, “roaming functions”, note that the movement of the mobile units (wireless node) causes a change in the relation between the wireless node access points, hence signal information is refreshed as movement continues), comprising receiving a request to estimate the location of a wireless node connected to a wireless network (paragraph 19, “initial decision on requesting association with an access point”);

collecting signal strength values of signals transmitted between a plurality of radio receivers and the wireless node; and computing the estimated location of the wireless node based at least in part on the collected signal strength values (Figures 2-3, and paragraph 24-25, “signal strengths .

. . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”).

Zegelin does not specifically disclose **terminating the connection between the wireless node and the wireless network**.

In the same field of endeavor, Lee discloses terminating the connection between the wireless node and the wireless network (paragraph 35, 64, and 65, “communication can be made only after terminating the current communication and performing a registration procedure”, “path between the previous Bluetooth access point is disconnected and communication with the new Bluetooth access point is achieved”).

It would have been obvious to one of the ordinary skills in the art at the time of invention by incorporating the teachings of Lee into that of Zegelin, and consequently providing the method of Zegelin with terminating the connection between the wireless node and the wireless network, as suggested by Lee, so that a better connection is achieved between the wireless node and the access point and consequently minimizing signal loss and disturbance.

Referring to claim 21, the combination of Zegelin/Lee disclose the method of claim 20, and further disclose the collecting step is performed at the wireless node (Zegelin, paragraph 19).

Referring to claim 23, the combination of Zegelin/Lee disclose the method of claim 20, and further disclose the computing step comprises providing the collected signal strength values to a wireless node location model that returns an estimated location for the wireless node (Zegelin, paragraphs 16-20, “computer 12 is advantageously used to enhance the association and

roaming functions”, “computer 12 . . . act as a cell controller”, “association . . . rated by a cell controller”).

Referring to claim 25, the combination of Zegelin/Lee discloses the method of claim 20, and further disclose the wireless network comprises at least one access point (Zegelin, Figure 1, “AP).

Referring to claim 27, the combination of Zegelin/Lee disclose the method of claim 20, and further disclose the computing step comprises identifying the access elements (radio receivers) associated with the signal strengths to be used in locating the wireless node; selecting aspects of an RF physical model associated with the identified radio receivers; and computing the estimated location of the wireless node using the signal strengths of the signals detected by the identified radio receivers, and the selected aspects of the physical model (Zegelin, Figures 1-3, paragraphs 16-22, and paragraphs 19-23, “proximity of the mobile unit”, “relative movement of the mobile unit with respect to access point”, “sequential location determinations” “initial decision on requesting association with an access point can be based on the signal strength of the beacon signals”, “first parameter is proximity of the mobile unit”, “relative movement”, “mobile unit can detect signal strength using the RSSI function”, “decision on association may be based on selection parameters”, note that each access point (access element) transmits a beacon signal and each beacon signal delivers a corresponding signal strength value that specifies a particular RF coverage area. And since the physical locations of the access elements are known, the RF coverage area corresponds to a physical locations of the access elements are able to cover).

Referring to 28, the combination of Zegelin/Lee disclose the method of claim 27, and further disclose the aspects of the RF physical model are coverage maps corresponding to respective radio receivers (Zegelin, paragraphs 19-23, “proximity of the mobile unit”, “relative movement of the mobile unit with respect to access point”, “sequential location determinations”).

Referring to claim 33, Zegelin discloses an apparatus facilitating the location of a wireless node connected to a wireless network, wherein the wireless node is operative to transmit wireless frames on a plurality of operating channels to discover access points with which to connect (Fig. 1, abstract, paragraphs 5, 8 and 10, “association between a mobile unit and an access point is changed as mobile units move within an area having a plurality of access points”, note that each access element in a WLAN is assigned a specific channel to communicate with the wireless nodes so that there is no interference with the other access elements, hence the wireless nodes are operative to transmit frames on a plurality of channels), comprising a plurality of radio receivers comprising at least one antenna, the plurality of radio receivers operative to detect the strength of signals transmitted by wireless nodes and provide the detected signal strengths to a wireless node location module (Fig. 2-5, paragraphs 5, and paragraph 20, 24-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”, note that access points are connected to the cell controller and the cell controller performs the ratings for the access points, hence the signal strengths were detected and transmitted from access points to the cell controller); and a wireless node location module operative (Fig. 1-2, and paragraphs 5, and paragraph 20, 24-25, cell controller, computer),

collect signal strength values, detected at a plurality of radio receivers, corresponding to signals transmitted by the wireless node; and compute the estimated location of the wireless node based at least in part on the signal strength values detected by the plurality of radio receivers (Figures 2-3, and paragraph 24-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”).

Zegelin does not specifically disclose selectively terminate the connection between the wireless node and the wireless network;

In the same field of endeavor, Lee discloses selectively terminating the connection between the wireless node and the wireless network (paragraph 35, 64, and 65, “communication can be made only after terminating the current communication and performing a registration procedure”, “path between the previous Bluetooth access point is disconnected and communication with the new Bluetooth access point is achieved”).

It would have been obvious to one of the ordinary skills in the art at the time of invention by incorporating the teachings of Lee into that of Zegelin, and consequently providing the method of Zegelin to selectively terminate the connection between the wireless node and the wireless network, as suggested by Lee, so that a better connection is achieved between the wireless node and the access point and consequently minimizing signal loss and disturbance.

Referring to claim 35, Zegelin discloses an apparatus facilitating the location of a wireless node connected to a wireless network, wherein the wireless node is operative to transmit wireless frames on a plurality of operating channels to discover access points with which to connect (Fig. 1, abstract, paragraphs 5, 8 and 10, “association between a mobile unit and an

access point is changed as mobile units move within an area having a plurality of access points”),
comprising

a communication module operative to interact with a plurality of radio receivers comprising at least one antenna, the plurality of radio receivers operative to detect the strength of signals transmitted by wireless nodes and provide the detected signal strengths to a wireless node location module (Fig. 1-5, paragraphs 5, and paragraph 20-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”, note that access points are connected to the cell controller and the cell controller performs the ratings for the access points, hence the signal strengths were detected and transmitted from access points to the cell controller); and

a wireless node location module operative (Fig. 1-2, and paragraphs 5, and paragraph 20, 24-25, cell controller, computer),

collect signal strength values, detected at a plurality of radio receivers, corresponding to signals transmitted by the wireless node; and compute the estimated location of the wireless node based at least in part on the signal strength values detected by the plurality of radio receivers (Figures 2-3, and paragraph 24-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”).

– Zegelin does not specifically disclose selectively terminate the connection between the wireless node and the wireless network.

In the same field of endeavor, Lee discloses selectively terminating the connection between the wireless node and the wireless network (paragraph 35, 64, and 65, “communication can be made only after terminating the current communication and performing a registration

procedure”, “path between the previous Bluetooth access point is disconnected and communication with the new Bluetooth access point is achieved”).

It would have been obvious to one of the ordinary skills in the art at the time of invention by incorporating the teachings of Lee into that of Zegelin, and consequently providing the method of Zegelin to selectively terminate the connection between the wireless node and the wireless network, as suggested by Lee, so that a better connection is achieved between the wireless node and the access point and consequently minimizing signal loss and disturbance.

Referring to claim 36, the combinations of Zegelin/Lee disclose the apparatus of claim 35, and further disclose the communication module comprises a network interface adapter (Figs. 1-3, “computer”, “AP”, note that the communication module (computer) communicates with the access points, hence it comprises a network interface card).

3. Claims 10-13 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zegelin (US Pub No. 2005/0185615 A1), in view of Lee (US Pub. No. 2002/0045424 A1), and further in view of Erskine (US Pub. No. 20040166878 A1).

Referring to claim 10, the combination of Zegelin/Lee disclose the method of claim 9.

The combination of Zegelin/Lee does not specifically disclose the coverage maps each comprise a plurality of location coordinates associated with corresponding signal strength values.

Erskine discloses the coverage maps each comprise a plurality of location coordinates associated with corresponding signal strength values (paragraph 66, “signal strength information to obtain the location coordinates”).

It would have been obvious to one of the ordinary skills in the art at the time the invention was made to incorporate the teachings of Erskine into that of Zegelin/Lee and consequently allowing the coverage maps of Zegelin/Lee to comprise a plurality of location coordinates associated with corresponding signal strength values, so that signal strengths are mapping to physical geographical locations are understood and observed with precision.

-- Referring to claim 11, the combination of Zegelin/Lee/Erskine discloses the method of claim 10, and further disclose the coverage maps are heuristically constructed (Erskine, paragraph 66, note that signal strength information is used to obtain the location coordinates of the wireless phone, and the location coordinates that are best fit based on the detected signal strength are found. Hence, it is inherent that the coverage maps (location coordinates) are heuristically constructed).

Referring to claim 12, the combinations of Zegelin/Lee/Erskine disclose the method of claim 10 and further disclose the coverage maps are based on a mathematical model (Erskine, paragraph 66, "signal strength information to obtain the location coordinates", note that location coordinates is a mathematical model).

Referring to claim 13, the combinations of Zegelin/Lee/Erskine disclose the method of claim 1, and further disclose the wireless node implements the 802.11 protocol (Zegelin, paragraphs 2-5, "802.11").

Referring to claim 29, the combination of Zegelin/Lee disclose the method of claim 28.

The combination of Zegelin/Lee does not specifically disclose the coverage maps each comprise a plurality of location coordinates associated with corresponding signal strength values.

– Erskine discloses the coverage maps each comprise a plurality of location coordinates associated with corresponding signal strength values (paragraph 66, “signal strength information to obtain the location coordinates”).

It would have been obvious to one of the ordinary skills in the art at the time the invention was made to incorporate the teachings of Erskine into that of Zegelin/Lee and consequently allowing the coverage maps of Zegelin/Lee to comprise a plurality of location coordinates associated with corresponding signal strength values, so that signal strengths are mapping to physical geographical locations are understood and observed with precision.

Referring to claim 30, the combination of Zegelin/Lee/Erskine discloses the method of claim 29, and further disclose the coverage maps are heuristically constructed (Erskine, paragraph 66, note that signal strength information is used to obtain the location coordinates of the wireless phone, and the location coordinates that are best fit based on the detected signal strength are found. Hence, it is inherent that the coverage maps (location coordinates) are heuristically constructed).

Referring to claim 31, the combinations of Zegelin/Lee/Erskine disclose the method of claim 29 and further disclose the coverage maps are based on a mathematical model (Erskine, paragraph 66, “signal strength information to obtain the location coordinates”, note that location coordinates is a mathematical model).

Referring to claim 32, the combinations of Zegelin/Lee/Erskine disclose the method of claim 20, and further disclose the wireless node implements the 802.11 protocol (Zegelin, paragraphs 2-5, "802.11").

4. Claims 37 and 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zegelin (US Pub No. 2005/0185615 A1), in view of Lee (US Pub. No. 2002/0045424 A1), and further in view of Molteni et al (US Pub. No. 2004/0066757 A1).

Referring to claim 37, Zegelin discloses a wireless network system facilitating the location of a wireless node, wherein the wireless node is operative to transmit wireless frames on a plurality of operating channels to discover access points with which to connect (Fig. 1, abstract, paragraphs 5, 8 and 10, "association between a mobile unit and an access point is changed as mobile units move within an area having a plurality of access points", note that each access element in a WLAN is assigned a specific channel to communicate with the wireless nodes so that there is no interference with the other access elements, hence the wireless nodes are operative to transmit frames on a plurality of channels), comprising a plurality of access elements for wireless communication with at least one remote client element and for communication with a central control element (Fig. 1-5, paragraphs 5-6, and paragraph 16-17, 20, 24-25, "signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit", note that access points are connected to the cell controller (central control element) and the cell controller performs the ratings for the access points);

wherein a RF coverage map, corresponding to each of the access elements, characterizes the signal strength values for locations in a physical region (Figures 1-3, paragraphs 17-21, and 23-25, “access points whose signal has the greatest signal level at the mobile unit”, “selecting an access point”, “proximity”, note that each access point (access element) transmits a beacon signal and each beacon signal delivers a corresponding signal strength value that specifies a particular RF coverage area. And since the physical locations of the access elements are known, the RF coverage area corresponds to a the physical locations of the access elements are able to cover, hence a RF coverage map, corresponding to each of the access elements, characterizes the signal strength values for locations in a physical region),

wherein the access elements are each operative to establish and maintain, in connection with a central control element, wireless connections with remote client elements (Figures 1-5, and paragraphs 19-21, note that association with an access point means connection and inherently maintaining that connection of the wireless node with access points);

detect the strength of received signals (Fig. 1-5, paragraphs 5, and paragraph 20, 24-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”, note that access points are connected to the cell controller and the cell controller performs the ratings for the access points, hence the signal strengths are detected and transmitted from access points to the cell controller); and

transmit received frames to a central control element (paragraphs 19-20, “access points which receive the association request from the mobile unit can be rated by a cell controller”, note that association requests are sent to the access elements (access points) and the cell controller (central

control element) rates them according to a score, hence the received frame (request for association) is transmitted from the access points to the cell controller);

at least one central control element for supervising the access elements (Figure 1, and paragraphs 16, 20, and 24-25, “cell controller”, “computer 12”),

wherein the central control element is operative to manage wireless connections between the access elements and corresponding remote client elements (Figure 1, and paragraphs 16, 20, and 24-25, “cell controller”, “computer 12”), and

store signal strength data transmitted by the plurality of access elements in association with wireless node identifiers (Figures 1-3, and paragraphs 19, 20, 24, “signal strength . . . used to evaluate merits”, “association . . . rated by a cell controller”, note that association between an access point and a mobile unit is managed by the cell controller and this management decision is based on the value of the signal strength, hence the cell controller (central control element) stores signal strength data transmitted by the access points so that it could calculate such values and come up with a score); and

a wireless node location module operative (Fig. 1-2, and paragraphs 5, and paragraph 20, 24-25, cell controller, computer 12) to compute the estimated location of the wireless node based at least in part on the signal strength values detected by the plurality of access elements (Figures 2-3, and paragraph 24-25, “signal strengths . . . between a mobile unit and access points is determined . . . to evaluate . . . to . . . locate the mobile unit”).

Zegelin does not specifically disclose **selectively terminate the connection between a wireless node and an access element.**

In the same field of endeavor, Lee discloses selectively terminating the connection between the wireless node and the wireless network (paragraph 35, 64, and 65, “communication can be made only after terminating the current communication and performing a registration procedure”, “path between the previous Bluetooth access point is disconnected and communication with the new Bluetooth access point is achieved”).

It would have been obvious to one of the ordinary skills in the art at the time of invention by incorporating the teachings of Lee into that of Zegelin, and consequently providing the wireless node location module of the system of Zegelin to selectively terminate the connection between the wireless node and the wireless network, as suggested by Lee, so that a better connection is achieved between the wireless node and the access point and consequently minimizing signal loss and disturbance.

The combination of Zegelin/Lee does not specifically disclose the access elements are each operative to **append a signal strength value to frames received from wireless nodes**; and the central control element is operative to store signal strength data **appended to frames** transmitted by the plurality of access elements.

Molteni discloses appending a signal strength value to frames received from wireless nodes (abstract, and paragraphs 29, 0105, 0110, 0117, 0129, 0186, and 0194, “the L3 information in the L2 frame received from the AP of the wireless network, a time stamp of when the L2 frame was received from the AP, and an indication of the signal strength of the L2 frame

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from the AP", note that the L2 frame from the AP (access point) contains an indication of the signal strength value, hence a signal strength value is appended to the frames transmitted by the access point).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Zegelin/Lee by incorporating the teachings of Molteni and consequently providing the access elements of the system of Zegelin/Lee to **append a signal strength value to frames received from wireless nodes, and further providing** the central control element of Zegelin/Lee to be operative to store signal strength data **appended to frames** transmitted by the plurality of access elements, as suggested by Molteni, so that signal strength data from the corresponding access element is securely transmitted.

Referring to claim 39, the combinations of Zegelin/Lee/Molteni disclose the system of claim 37, and further disclose the wireless node location module resides in a network management system (Zegelin, Figs. 1-3, and paragraphs 16, 19-20, and 24, note that system 10 is a network management system).

Referring to claim 40, the combinations of Zegelin/Lee/Molteni disclose the system of claim 37, and further disclose the wireless node location module resides in the central control element (Zegelin, Figs. 1-3, and paragraphs 16, 19-20, and 24).

Referring to claim 41, the combinations of Zegelin/Lee/Molteni disclose the system of claim 37, and further disclose the wireless node location module maintains a signal strength matrix including values representing the strength of signals detected between the access elements (Zegelin, paragraphs 17-20, and 23-24, "database that relates signal strength to location", "association . . . rated by a cell controller according to score").

Referring to claim 42, the combinations of Zegelin/Lee/Molteni disclose the system of claim 37, and further disclose the frames are 802.11 frames (Zegelin, paragraphs 2-5, "802.11").

Referring to claim 43, the combinations of Zegelin/Lee/Molteni disclose the system of claim 38, and further disclose the wireless node identifiers are MAC addresses (Molteni, paragraphs 56, 0102, "MAC frames").

5. Claims 3, 14-17, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zegelin (US Pub No. 2005/0185615 A1), in view of Lee (US Pub. No. 2002/0045424 A1), and further in view of well known prior art (MPEP 2144.03).

Referring to claim 3, the combination of Zegelin/Lee disclose the method of claim 2.

The combination of Zegelin/Lee does not disclose the wireless node location model triangulates the estimated location of the wireless node based on the collected signal strength values and the locations of the plurality of radio receivers.

The examiner takes official notice of the fact that location estimation of wireless nodes via triangulating is well known in the art.

It would have been obvious to one of the ordinary skills in the art at the time the invention was made to incorporate the teachings of prior art and consequently providing the method of Zegelin/Lee to triangulate the estimated location of the wireless node based on the collected signal strength values and the locations of the plurality of access elements, for the purpose of determining an improved location estimation.

Referring to claim 14, the combinations of Zegelin/Lee disclose the method of claim 1, and further disclose the at least one wireless node and the radio receivers are capable of operating in more than one radio frequency band (Figures 1-3, and paragraphs 16-20, and 23-25, note that the access nodes inherently operate at different frequency bands so that interference is avoided, and thus the wireless node operates in multiple frequency bands).

The combination of Zegelin/Lee does not specifically disclose the location of the wireless node is computed based on the signal strength values detected by the radio receivers and the radio frequency band associated with the signal strength values.

The examiner takes official notice of the fact that computing location based on the signal strength values detected by the access elements is well known in the art.

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the method of Zegelin/Lee/Erskine by providing computing location based on the signal strength values detected by the access elements, as is well known in the art, and consequently providing the method of Zegelin/Lee/Erskine with at least one wireless node and the access elements (radio receivers) to be capable of operating in more than one radio frequency band, and wherein the location of the wireless node to be computed based on the signal strength

values detected by the access elements and the radio frequency band associated with the signal strength values, for the purpose of controlling radio traffic and reducing signal disturbance.

Referring to claim 15, the combinations of Zegelin/Lee disclose the method of claim 14, and further disclose the computing step comprises identifying the radio receivers associated with the signal strengths to be used in locating the wireless node selecting aspects of an RF physical model associated with the identified radio receivers and the radio frequency band on which the signal strengths were detected by the radio receivers; and computing the estimated location of the wireless node using the signal strengths of the signals detected by the identified radio receivers, and the selected aspects of the physical model (Zegelin, paragraphs 5, 16-20, 24, “requesting association with an access point”, “RSSI”, “evaluate the merits of selecting an access point”).

Referring to claim 16, the combinations of Zegelin/Lee disclose the method of claim 15, and further disclose the aspects of the RF physical model are coverage maps corresponding to respective radio receivers (Zegelin, Figures 1-3, paragraphs 16-22, and paragraphs 19-23, “proximity of the mobile unit”, “relative movement of the mobile unit with respect to access point”, “sequential location determinations” “initial decision on requesting association with an access point can be based on the signal strength of the beacon signals”, “first parameter is proximity of the mobile unit”, “relative movement”, “mobile unit can detect signal strength using the RSSI function”, “decision on association may be based on selection parameters”).

Referring to claim 17, the combination of Zegelin/Lee disclose the method of claim 16, and further disclose the coverage maps each comprise a plurality of location coordinates

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associated with corresponding signal strength values (Zegelin, Figures 1-3, paragraphs 16-22, and paragraphs 19-23, “proximity of the mobile unit”, “relative movement of the mobile unit with respect to access point”, “sequential location determinations” “initial decision on requesting association with an access point can be based on the signal strength of the beacon signals”, “first parameter is proximity of the mobile unit”, “relative movement”, “mobile unit can detect signal strength using the RSSI function”, “decision on association may be based on selection parameters”).

Referring to claim 22, the combination of Zegelin/Lee disclose the method of claim 20.

The combination of Zegelin/Lee does not specifically disclose signal strength values are measured at the access elements.

The examiner takes official notice of the fact that measuring signal strength values at an access element is well known in the art.

It would have been obvious to one of the ordinary skill in the art at the time of invention to incorporate the teachings of well known prior art into the method of Zegelin/Lee and consequently providing signal strength values to be measured at the access elements, for the purpose of having another source for measuring signal strength.

Referring to claim 24, the combination of Zegelin/Lee disclose the method of claim 23.

The combination of Zegelin/Lee does not disclose the wireless node location model triangulates the estimated location of the wireless node based on the collected signal strength values and the locations of the plurality of access elements.

The examiner takes official notice of the fact that location estimation of wireless nodes via triangulating is well known in the art.

It would have been obvious to one of the ordinary skills in the art at the time the invention was made to incorporate the teachings of prior art and consequently providing the method of Zegelin/Lee to triangulate the estimated location of the wireless node based on the collected signal strength values and the locations of the plurality of access elements, for the purpose of determining an improved location estimation.

6. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zegelin (US Pub No. 2005/0185615 A1), in view of Lee (US Pub. No. 2002/0045424 A1), further in view of Erskine et al (US Pub. No. 2004/0166878 A1), and further in view of well known prior art (MPEP 2144.03).

Referring to claim 18, the combination of Zegelin/Lee/Erskine disclose the method of claim 17.

The combination of Zegelin/Lee/Erskine does not disclose the coverage maps are heuristically constructed.

Erskine discloses the coverage maps are heuristically constructed (paragraph 66, note that signal strength information is used to obtain the location coordinates of the wireless phone, and the location coordinates that are best fit based on the detected signal strength are found. Hence, it is inherent that the coverage maps (location coordinates) are heuristically constructed).

It would have been obvious to one of the ordinary skills in the art at the time the invention was made to incorporate the teachings of Erskine into that of Zegelin/Lee and consequently allowing the coverage maps of Zegelin/Lee to comprise a plurality of location coordinates associated with corresponding signal strength values, so that signal strengths are mapping to physical geographical locations are understood and observed with precision.

Referring to claim 19, the combination of Zegelin/Lee/Erskine disclose the method of claim 17.

The combination of Zegelin/Lee does not disclose the coverage maps are based on a mathematical model.

Erskine discloses the coverage maps are based on a mathematical model (paragraph 66, “signal strength information to obtain the location coordinates”, note that location coordinates is a mathematical model).

It would have been obvious to one of the ordinary skills in the art at the time the invention was made to incorporate the teachings of Erskine into that of Zegelin/Lee and consequently allowing the coverage maps of Zegelin/Lee to be based on a mathematical model, so that signal strengths are mapping to physical geographical locations are understood and observed with precision.

Allowable Subject Matter

7. Claims 7, 26, 34, and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hind et al. U.S. Pub. No. 2004/0203910 A1 discloses spatial boundary admission control for wireless networks and location determination.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred A. Casca whose telephone number is (571) 272-7918. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid, can be reached at (571) 272-7922. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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